# CLAIMS

What is claimed is:

1. A method comprising:

providing a first wafer having a stack structure of a first base substrate, a layer of relaxed film, and a first layer of strained film,

depositing a layer of oxide onto the layer of strained film to provide an adhesion surface to the first wafer;

providing a second wafer, the second wafer being a silicon on insulation (SOI) wafer having a stack structure of a second base substrate and a layer of oxidized film;

attaching the first and second wafers; and

heating the first and second wafers at a first temperature to cause a silicon dioxide ($SiO_2$) adhesion of the first substrate to the second substrate.

2. The method of claim 1 further comprising:

implanting hydrogen onto the first wafer before depositing the layer of oxide onto the second layer of strained film to create an embrittled region in the layer of relaxed film.

3. The method of claim 2 further comprising:

heating the first and second wafers at a second temperature to delaminate the two wafers along the embrittled region to form the second wafer having the layer of relaxed film.

4. The method of claim 3 further comprising:

etching the relaxed film on the surface of the second wafer to expose the strained film.

5. The method of claim 1 wherein the first and second base substrates are made of silicon material.

6. The method of claim 1 wherein the layer of relaxed film is a relaxed Silicon Germanium (SiGe) layer having a thickness in a range of approximately 0.1 to 3.0um.

7. The method of claim 1 wherein the layer of oxide is deposited at a thickness range of approximately 50 to 3000A.

8. The method of claim 2 wherein the hydrogen is implanted at an energy range of approximately 1 to 20keV.

9. The method of claim 3 wherein the second temperature is higher than the first temperature.

10. The method of claim 3 wherein the first temperature is in a range of approximately 100 °C to 300 °C.

11. The method of claim 3 wherein the second temperature is in a range of 400 °C to 600 °C.

12. The method of claim 1 further comprising:

etching the first base substrate, and the layer of relaxed film to result in the strain of film on the surface of the SOI wafer.

13. The method of claim 12 wherein the etching of the first layer of strained film comprises wet etching the layer of relaxed film.

14. A wafer comprising:

a silicon layer;

a relaxed SiGe layer; and

a strained silicon layer in contact with the relaxed SiGe layer, the strained silicon layer being transferred to the top of the relaxed SiGe layer by a heat treatment.

15. The wafer of claim 14 wherein the relaxed SiGe layer contains an embrittled region.

16. The wafer of claim 15 wherein the embrittled report is created by implanting hydrogen ions.

17. A wafer comprising:

a silicon layer;

a $SiO_2$ layer in contact with the silicon layer; and

a strained silicon layer on top of the $SiO_2$ layer, the strained silicon layer being transferred to an oxidized wafer by a heat treatment.

18. The wafer of claim 17 wherein the oxidized wafer contains a relaxed SiGe layer.

19. The wafer of claim 18 wherein the relaxed SiGe layer contains an embrittled region.